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EXAMINER

ZEWDU, MELESS NMN

ART UNIT PAPER NUMBER

2683

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/004,989

Applicant(s)

TERRANOVA ET AL.

Examiner

Meless N Zewdu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 06 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-84 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20, 22-24, 26-39, 43, 44, 46-58, 62-67, 69-80 and 82-84 is/are rejected.
- 7) ☒ Claim(s) 21, 25, 40-42, 45, 59-61, 68 and 81 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. This action is in response to the communication filed on 7/6/04.
2. Claims 1-84 are pending in this action.
3. This actions final.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 6-20, 24, 26-39, 43-44, 46-52, 54-58, 62-64, 69-77 and 82-84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Palmero et al. (WO 96/37052) in view of Kommrusch (3,906,405).

**As per claim 1:** a method for supporting inductive communication, the method comprising the steps of:

coupling a transducer to a selected first or second circuit for either transmitting or receiving reads on '052 (see page 5, lines 10-24). But, Palmero does not explicitly teach about adjusting electrical characteristics of the first circuit to increase a magnetic field generated by the transducer and adjusting electrical characteristics of the second circuit to increase a signal generated by the transducer, as claimed by applicant. However, in

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a related field of endeavor, Kommrusch teaches about tunable antenna coupling circuit that control the effective values in the circuit to match the impedance of an antenna at different frequencies to efficiently apply signals between the antenna and the transceiver (see entire document, particularly col. 1, line 36-col. 2, line 31). Both of the prior art references are wireless systems, particularly directed to coupling tunable antenna/s to a transceiver using circuit adjustment techniques. Hence, the references are reasonably combinable. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify Palmero's reference with the teaching of Kommrusch for the advantage of providing an improved automatic coupling circuit which is operable over a wide frequency range for coupling signals between an antenna/transducer and a radio equipment/transceiver (see col. 1, lines 36-39).

**As per claim 2:** a method, wherein the characteristics of the first and second circuits are adjusted using passive circuit components reads on '405 (see col. 1, line 44-col. 2, line 31). Capacitors and inductors of the prior art are passive components.

**As per claim 3:** a method as in claim 1 further comprising the steps of:

transmitting a magnetic field over the transducer when the transducer is coupled to the first circuit reads on '052 (see page 5, lines 10-24).

receiving a magnetic field over the transducer when the transducer is coupled to the second circuit reads on '052 (see page 5, lines 10-24).

**As per claim 4:** a method, further comprising the step of:

adjusting a capacitance of the first circuit to reduce an effective impedance of the transducer for transmitting reads on '405 (see col. 1, line 44-col. 2, line 31; col. 2, line 45-col. 3, line 21).

adjusting a capacitance of the second circuit to increase an effective impedance of the transducer for receiving reads on '405 (see col. 1, line 44-col. 2, line 31; col. 2, line 45-col. 3, line 21). In a duplexer, the first and the second circuits have to be independently adjusted.

**As per claim 6:** a method, wherein the electrical characteristics of the first and second circuits are adjusted to achieve an efficient coupling between either a transmitter or receiver reads on '405 (see col. 1, line 44-col. 2, line 31).

**As per claim 7:** a method, further comprising the step of:

adjusting a reactance of the first circuit to transmit a magnetically encoded signal at a first carrier frequency and adjusting characteristics of the second circuit to receive a magnetically encoded signal at a second carrier frequency reads on '405 (see col. 1, line 44-col. 2, line 31; col. 2, line 45-col. 21). Transmitting magnetically encoded signal is provided by Palmero. When the references are combined as discussed above, adjusting the characteristics of the circuits (transceiver), as taught by Kommrusch, will benefit Palmeros inductive communication system.

**As per claim 8:** a method, further comprising the step of:

disposing an inductive element in the second circuit, the inductive element having an approximate inductance as that of the transducer reads on '405 (see col. 1, line 44-col. 2, line 31; col. 2, line 45-col. 3, line 21).

**As per claim 9:** a method, wherein the second circuit includes at least a portion of the first circuit that is coupled via a switch reads on '052 (see page 5, lines 10-24). Since the duplex includes a switch/selecting circuit, at least a portion of one circuit must be part of the other (as it relates transmitter and receiver).

**As per claim 10:** a method, wherein the first circuit serially tunes the transducer for transmitting over the transducer and the second circuit parallel tunes the transducer for receiving over the transducer reads on '405 (see col. 1, line 44-col. 2, line 20). Specific configuration of a circuit components is a choice of design. As can be seen in the prior art, the components provided therein provide an efficient coupling between an antenna/transducer and the transceiver devices/circuitries.

**As per claim 11:** a method for supporting communication, the method comprising the steps of:

switching to select either transmitting or receiving over a transducer reads on '052 (see page 5, lines 10-27). A selecting circuitry includes a switching function. But, Palmero does not explicitly teach about effectively tuning the transducer, via a first circuit, to be a low impedance device for generating a magnetic field when a transmitter is switched to transmit over the transducer, and via a second circuit, effectively tuning the transducer to be a high impedance device for receiving a magnetic field when a receiver is

switched to receive over the transducer, as claimed by applicant. However, in a related field of endeavor, Kommrusch teaches about tunable antenna coupling circuit that control the effective values in the circuit to match the impedance of an antenna at different frequencies to efficiently apply signals between the antenna and the transceiver (see entire document, particularly col. 1, line 36-col. 2, line 31). Both of the prior art references are wireless systems, particularly directed to coupling tunable antenna/s to a transceiver using circuit adjustment techniques. Hence, the references are reasonably combinable. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify Palmero's reference with the teaching of Kommrusch for the advantage of providing an improved automatic coupling circuit which is operable over a wide frequency range for coupling signals between an antenna/transducer and a radio equipment/transceiver (see col. 1, lines 36-39).

**As per claim 12:** a method, wherein the first circuit is serially tuned for transmitting over the transducer and the second circuit is parallel tuned for receiving over the transducer reads on '405 (see col. 1, line 44-col. 2, line 20). Specific configuration of a circuit components is a choice of design. As can be seen in the prior art, the components provided therein provide an efficient coupling between an antenna/transducer and the transceiver devices/circuitries.

**As per claim 13:** a method, further comprising the step of:  
in a transmitting mode, reducing an overall reactance of the first circuit including the transducer by substantially matching an inductance of the transducer with a capacitance provided by the first circuit reads on '405 (see col. 1, line 44-col. 2, line 20).

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**As per claim 14:** a method, further comprising the step of:

via switching, decoupling the transmitter from the first circuit and transducer, and coupling the receiver and portion of the second circuit to the first circuit and the transducer reads on '052 (see page 5, lines 10-27). A duplexer with a selecting circuit connects a transducer with a first and second circuit (transceiver) as needed.

**As per claim 15:** a method, further comprising the step of from the transmitter, generating an output at one of two voltages that is coupled to drive the transducer reads on '052 (see page 5, lines 10-27). Selecting the strongest signal includes outputting at least one voltage that is coupled to drive the transducer.

**As per claim 16:** a method, further comprising the step of:

disposing a resistance in series with the transducer reads on '405 (see col. 1, line 44-col. 2, line 31). Impedance matching includes resistance.

**As per claim 17:** a method, further comprising the step of:

tuning a combined impedance of the first circuit and transducer for maximal magnetic power output of the transducer at a particular carrier frequency reads on '405 (see col. 1, line 44-col. 2, line 31).

**As per claim 18:** a method, further comprising the step of:

adjusting an impedance of the first and second circuit to transmit and receive over the transducer at a substantially similar carrier frequency reads on '405 (see col. 1, line 44-col. 2, line 31).

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**As per claim 19:** a method, further comprising the step of:

varying inductive characteristics of the transducer to adjust a combined impedance of the first circuit and transducer reads on '405 (see col. 1, line 44-col. 2, line 31).

**As per claim 20:** a method, further comprising the step of:

adjusting a reactance of the first or second circuits by switching selected capacitors of a capacitor bank reads on '405 (see col. 2, line 50-col. 3, line 21).

**As per claim 24:** a method, further comprising the step of:

in a receiving mode, coupling at least a portion of the first circuit to the second circuit via a switch and decoupling the transmitter from at least a portion of the first circuit and transducer reads on '052 (see page 5, lines 10-24). A duplexer with a selecting circuit functions in two modes (transmit and receive) by being coupled and decoupled.

**As per claim 26:** a method, wherein a combined reactance of the second circuit coupled with at least a portion of the first circuit is reduced via an inductor matched with an inductance of the transducer reads on '405 (see col. 1, line 44-col. 2, line 20; col. 2, line 40-col. 3, line 21).

**As per claim 27:** a method, further comprising the step of:

disposing an electronic switch circuit between an output of the transmitter and the first circuit for coupling and decoupling the transmitter to the first circuit reads on '052 (see page 5, lines 10-24). A selecting circuitry is a switch.

**As per claim 28:** a method, further comprising the steps of:

providing switching capability to select which of multiple transducers to transmit and receive a magnetically encoded signal depending on which transducer is selected reads

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on '052 (see page 2, lines 10-20; page 5, lines 10-27), adjusting an impedance of the first or second circuit reads on '405 (see col. 1, line 44-col. 2, line 20).

**As per claim 29:** a method, further comprising the steps of:

adjusting a reactance of the first circuit depending on a selected one of the multiple transducers to minimize an overall impedance of the selected transducer and first circuit reads on '405 (see col. 1, line 44-col. 2, line 31).

driving a combination of the selected one of the multiple transducers and the first circuit with the transmitter reads on 405 (see col. 2, lines 14-31).

**As per claim 30:** a method, further comprising the step of:

disposing the multiple transducers to be substantially orthogonal to each other reads on '052 (see page 1, lines 10-20).

**As per claim 31:** a method, further comprising the step of:

switching the first and second circuit to transmit on one transducer while receiving on another transducer reads on '052 (see page 5, lines 10-24).

**As per claim 32:** a method, further comprising the step of:

switching the second circuit and receiver to receive on a different transducer when no signal is received on a particular transducer reads on '052 (see page 5, lines 10-24).

**As per claim 33:** a method, further comprising the steps of:

setting switch circuitry to receive over the transducer reads on '052 (see page 5, lines 13-20).

transmitting a signal at a particular carrier frequency on a second transducer whose output couples to the transducer reads on '052 (see page 5, lines 10-24).

adjusting a reactance of the second circuit to receive a maximum signal over the transducer reads on '405 (see col. 1, line 44-col. 2, line 31).

**As per claim 34:** a method, further comprising the step of:

disposing a switch at an output of the transmitter to couple the transmitter to the first circuit and transducer reads on '052 (see page 5, lines 10-24). The selecting circuitry can be considered a switch.

**As per claim 35:** a method, further comprising the step of:

switching to a receiving mode to receive over the transducer reads on '052 (see page 5, lines 10-24).

increasing an effective impedance of the transducer to receive an optimal signal at the receiver reads on '405 (see col. 1, line 44-col. 2, line 31).

**As per claim 36:** a method for supporting communication comprising the steps of:

switching to select one of multiple circuit paths for either transmitting or receiving over a transducer via inductive coupling reads on '052 (see page 5, lines 18-20). A circuitry that can select includes a switch. But, Palmero does not explicitly teach about reducing an overall impedance of a first circuit path including the transducer to transmit an inductive signal over the transducer and reducing an overall impedance of at least a portion of a second circuit path including a switch for receiving an inductive signal over the transducer, as claimed by applicant. However, in a related field of endeavor, Kommrusch teaches about tunable antenna coupling circuit that control the effective values in the circuit to match the impedance of an antenna at different frequencies to

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efficiently apply signals between the antenna and the transceiver (see entire document, particularly col. 1, line 36-col. 2, line 31). Both of the prior art references are wireless systems, particularly directed to coupling tunable antenna/s to a transceiver using circuit adjustment techniques. Hence, the references are reasonably combinable. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify Palmero's reference with the teaching of Kommrusch for the advantage of providing an improved automatic coupling circuit which is operable over a wide frequency range for coupling signals between an antenna/transducer and a radio equipment/transceiver (see col. 1, lines 36-39).

**As per claim 37:** a method, further comprising the steps of:

switching a transmitter to transmit over the transducer via the first circuit path reads on '052 (see page 5, lines 13-27).

reducing an overall impedance of the first circuit path including the transducer by substantially matching an impedance of the transducer with circuit components disposed along the first circuit path reads on '405 (see col. 1, line 36-col. 2, line 31).

**As per claim 38:** a method, wherein the circuit components along the first path includes at least one capacitor to reduce an overall impedance of the first circuit reads on '405 (see col. 1, line 44-col. 2, line 31; col. 2, line 50-col. 3, line 21). The capacitor bank of the prior art is used to adjust the over all circuit impedance.

**As per claim 39:** a method, further comprising the step of:

disposing the second circuit path to include at least a portion of the first circuit path reads on '052 (see page 5, lines 10-24).

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decoupling the transmitter from the first circuit path via a first switch reads on '052 (see page 5, lines 10-24). A selecting circuitry is a switch to the duplex.

**As per claim 43:** a method wherein the second circuit path includes a serially disposed switch reads on reads on '052 (see page 10-27). A switch is know to be in series to with the device it controls.

**As per claim 44:** a method further comprising the step of:  
tuning a combined reactance along the first circuit path including the transducer for maximal magnetic power output of the transducer at a particular carrier frequency reads on '405 (see col. 1, line 44-col. 2, line 20).

**As per claim 46:** a method further comprising the step of:  
selecting among which of the multiple transducers to transmit and receive information reads on '052 (see page 5, lines 10-24; page 6, lines 19-30).

depending on which transducer is selected, adjusting an impedance along a corresponding circuit path to respectively transmit or receive over the selected transducer reads on '405 (see col. 1, line 36-col. 2, line 31).

**As per claim 47:** a method further comprising the step of:  
disposing the multiple transducers to be substantially orthogonal to each other reads on '052 (see page 5, lines 13-27).

**As per claim 48:** a method further comprising the steps of:  
coupling a receiver to the second circuit path for receiving over the transducer reads on '052 (see page 5, lines 10-24). A duplexer is able to couple a transducer to a transmitter and a receiver (a first and a second circuits) as needed.

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transmitting a signal at a particular carrier frequency on a second transducer whose output couples to the transducer reads on '052 (see abstract; page 5, lines 10-24). The prior art reference is able to select a particular carrier frequency.

adjusting a reactance along the second circuit path to receive a maximum signal at the receiver reads on '405 (see col. 1, line 44-col. 2, line 31; col. 2, line 45-col. 3, line 21).

Impedance matching includes adjusting reactance of a capacitor.

**As per claim 49:** a method further comprising the step of:

Reducing the reactance of a portion along the second circuit path for receiving over the transducer reads on '405 (see col. 1, line 36-col. 2, line 31).

**As per claim 50:** a method further comprising the step of:

tuning the transducer with a capacitor in parallel with the transducer reads on '405 (see col. 1, line 44-col. 2, line 20).

**As per claim 51:** a method for supporting communication comprising the steps of:

coupling one of multiple transducers to a circuit to transmit or receive a magnetic field reads on '052 (see page 2, lines 8-20). But, Palmero does not explicitly teach about adjusting characteristics of the circuit depending on which of the multiple transducers is coupled to the circuit, as claimed by applicant. However, in a related field of endeavor, Komrmusch teaches about tunable antenna coupling circuit that control the effective values in the circuit to match the impedance of an antenna at different frequencies to efficiently apply signals between the antenna and the transceiver (see entire document, particularly col. 1, line 36-col. 2, line 31). Both of the prior art references are wireless

systems, particularly directed to coupling tunable antenna/s to a transceiver using circuit adjustment techniques. Hence, the references are reasonably combinable. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify Palmero's reference with the teaching of Kommursch for the advantage of providing an improved automatic coupling circuit which is operable over a wide frequency range for coupling signals between an antenna/transducer and a radio equipment/transceiver (see col. 1, lines 36-39). **s per claim 52:** a method, wherein a capacitance of the circuit is adjusted to tune the transducer reads on '405 (see col. 2, lines 13-20). When the references are combined as discussed above, the capacitance of the circuit provided by Kommrusch, will be adjusted (with values from the cap. bank) to tune Palmero's transducer.

**As per claim 52:** a method, wherein a capacitance of the circuit is adjusted to tune the transducer reads on '405 (see col. 1, line 44-col. 2, line 31; col. 2, line 45- col. 3, line 21).

**As per claim 54:** a method, further comprising the step of:  
selecting a setting of the circuit via electronic switching to tune the transducer reads on '405 (see col. 1, lines 44-59).

**As per claim 55:** a method, further comprising the step of:  
positioning each of the multiple transducers along a unique axis with respect to each other reads on '052 (see page 5, lines 13-27).

**As per claim 56:** a method, further comprising the step of:

orthogonally positioning three transducers with respect to each other reads on '052 (see page 5, lines 13-27).

**As per claim 57:** a method further comprising the step of:

selecting from which of the multiple transducers to transmit or receive a magnetic field reads on '052 (see page 5, lines 10-27).

tuning the selected transducer to support a wireless link with a remote transceiver device having a single transducer that transmits and receives reads on '052 (see page 6, lines 13-30).

**As per claim 58:** a method further comprising the step of:

adjusting an impedance of the circuit to tune a transducer for transmitting or receiving reads on '405 (see col. 1, lines 59-65).

**As per claim 59:** a method further comprising the steps of:

coupling a first transducer of the multiple transducers to the circuit for transmitting reads on '052 (see page 5, lines 10-12).

coupling a second transducer of the multiple transducers to the circuit for receiving reads on '052 (see page 5, lines 10-12).

transmitting a signal over the first transducer and receiving the signal over the second transducer reads on 052 (see page 5, lines 10-12).

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**As per claim 62:** a method further comprising:

sweeping through a range of circuit settings to determine which of multiple settings is optimal for transmitting or receiving over a selected transducer reads on '405 (see col. 1, lines 44-65).

**As per claim 63:** a method further comprising:

Reducing power consumption of the circuit by increasing a magnetic a magnetic signal generated by a selected transducer based upon adjustment to the circuit reads on '052 (see abstract; page 4, line 28-page 5, line 3).

**As per claim 64:** a method further comprising:

Switching selected capacitors of a capacitor bank to ground via switches to tune a transducer for transmitting or receiving reads on '405 (see col. 1, line 44-col. 2, line 31; col. 2, line 50-col. 3, line 21).

**As per claim 69:** a method further comprising:

adjusting the circuit to transmit or receive over the transducer at a selected carrier frequency reads on '052 (see page 6, lines 13-30).

**As per claim 70:** a method further comprising:

modulating digital data on the carrier frequency to transmit information to a target receiver reads on '052 (see page 1, lines 28-29; page 2, lines 8-20; page 6, lines 13-30).

**As per claim 71:** a method for supporting inductive communication comprising the steps of:

coupling a transducer to a circuit to transceiver a magnetic field reads on '053 (see fig. 5; page 5, lines 13-20). But, Palmero does not explicitly teach about adjusting characteristics of the circuit to transceive over the transducer, as claimed by applicant. However, in a related field of endeavor, Kommrusch teaches about tunable antenna coupling circuit that control the effective values in the circuit to match the impedance of an antenna at different frequencies to efficiently apply signals between the antenna and the transceiver (see entire document, particularly col. 1, line 36-col. 2, line 31). Both of the prior art references are wireless systems, particularly directed to coupling tunable antenna/s to a transceiver using circuit adjustment techniques. Hence, the references are reasonably combinable. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify Palmero's reference with the teaching of Kommrusch for the advantage of providing an improved automatic coupling circuit which is operable over a wide frequency range for coupling signals between an antenna/transducer and a radio equipment/transceiver (see col. 1, lines 36-39).

**As per claim 72:** a method, wherein a capacitance of the circuit is adjusted to tune the transducer reads on '405 (see col. 2, lines 13-20). When the references are combined as discussed above, the capacitance of the circuit provided by Kommursch, will be adjusted (with values from the cap. bank) to tune Palmero's transducer.

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**As per claim 73:** a method, wherein the circuit is adjusted to independently tune the transducer for transceiving an inductive signal reads on '405 (see col. 1, lines 59-65).

**As per claim 74:** a method, further comprising the step of:  
selecting a setting of the circuit via electronic switching to tune the transducer reads on '405 (see col. 1, lines 44-59).

**As per claim 75:** a method, further comprising:  
sweeping through a range of circuit settings to determine which of multiple settings is optimal for transceiving over the transducer reads on '405 (see col. 1, lines 44-65).

**As per claim 76:** a method further comprising:  
reducing power consumption of the circuit by adjusting the circuit for generating a more efficient magnetic signal reads on '052 (see abstract; page 4, line 28-page 5, line 3).

**As per claim 77:** a method, further comprising:  
switching selected capacitors of a capacitor bank to ground via switches to tune the transducer for transceiving reads on '405 (see col. 1, line 44-col. 2, line 31; col. 2, line 50-col. 3, line 21).

**As per claim 82:** a method, further comprising:  
adjusting the circuit to transceive over the transducer at a selected carrier frequency reads on '052 (see page 6, lines 13-30).

**As per claim 83:** a method, further comprising:  
modulating digital data on the carrier frequency to transmit information to a target receiver reads on '052 (see page 1, lines 28-29; page 2, lines 8-20; page 6, lines 13-30).

**As per claim 84:** a method, further comprising:

switching an inductor in series with the transducer to tune the transducer for receiving a magnetic field reads on '405 (see col. 1, lines 40-65; col. 2, line 59-col. 3, line 21).

Claims 5, 22-23 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Palmero in view of Petro as applied to claims 1, 12, 36, 51 and 71 above, and further in view of Shloss et al. (Shlos) (US 5,425,032).

**As per claim 5:** but, Palmero in view of Kommrusch do not explicitly teach about a method of time division multiplexing the transducer between the first and second circuits to support bidirectional communication with a transceiver at a remote location, as claimed by applicant. However, in a related field of endeavor, Shloss teaches about a TDMA network used for communication between a reader and a transponder for a short range communication (see col. 3, lines 6-32; col. 4, lines 13-38; col. 5, lines 8-20; col. 7, line 23-col. 8, line 2). Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to further modify the above references with the teaching of Shloss for the advantage of enabling many users share a single frequency channel by taking turns (see col. 7, lines 3-9).

**As per claim 22:** a method, wherein information is transmitted and received over the transducer based on time division multiplexing read on '032 (see col. 3, lines 6-32; col. 4, lines 13-38; col. 5, lines 8-20; col. 7, line 23-col. 8, line 2). Since claim 32 is similar to claim 5, it is rejected on the same ground and motivation as claim 5.

**As per claim 23:** a method, wherein the transducer supports half-duplex communication with a remote transceiver reads on '052 (see page 6, lines 19-30).

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**As per claim 53:** a method as in claim, wherein the circuit is adjusted to independently tune the transducer for transmitting or receiving at different time intervals reads on '032 (see col. 3, lines 6-32; col. 4, lines 13-38; col. 5, lines 8-20; col. 7, line 23-col. 8, line 2). Since claim 53 is similar to claim 5, it is rejected on the same ground and motivation as claim 5.

Claims 78-80 and 65-67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Palmero in view of Petro as applied to claim 71 above, and further in view of Wilkins et al. (Wilkins) (US 4,965,607).

**As per claim 78:** but, Palmero in view of Kommrusch do not explicitly teach about a method of:

storing circuit setting information in memory regarding how to set a circuit, as claimed by applicant. However, in a related field of endeavor, Wilkins teach about an antenna coupler wherein the coupler includes a means for tracking the frequency of a swept transmitted signal and a means responsive to tracked signal for automatically adjusting the adjustable impedance matching means to provide proper impedance matching (see col. 1, lines 55-64; col. 2, lines 39-45) and wherein the coupler recalls the matched network settings from **memory** (see col. 3, line 65-col. 4, line 3). Note: using the circuit settings for transceiving over the transducer is an intended use. The stored circuit settings, as can be understood by one of ordinary skill in the art, can also be used in other areas of communications. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to further modify the above

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references with the teaching of Wilkins for the advantage of tuning the antenna to a desired frequency without a transmit tune sequence (see col. 4, lines 2-3).

**As per claim 79:** a method, further comprising:

learning which of multiple settings is optimal for transceiving over the transducer and storing corresponding information in memory reads on '607 (see col. 3, line 65-col. 4, line 3).

**As per claim 80:** a method, further comprising:

retrieving circuit setting information from memory and adjusting characteristics of the circuit to transceive over the transducer reads on '607 (see col. 3, line 65-col. 4, line 3).

Tuning an antenna requires an adjustment of a radio equipment.

**As per claim 65:** a method further comprising:

storing circuit setting information in memory regarding hoe to set a circuit for receiving or transmitting reads on '607 (see col. 3, line 65-col. 4, line 3).

**As per claim 66:** a method further comprising:

learning which of multiple settings is optimal and storing corresponding informnation in memory reads on reads on '607 (see col. 3, line 65-col. 4, line 3).

**As per claim 67:** a method further comprising:

retrieving circuit setting information from memory and adjusting characteristics of the circuit to transmit or receive over a transducer reads on '607 (see col. 3, line 65-col. 4, line 3). Tuning an antenna requires an adjustment of a radio equipment.

### ***Response to Arguments***

Applicant's arguments filed 7/6/04 have been fully considered but they are not persuasive. Applicant's argument and examiner's respective responses are provided as shown below.

**Argument I:** with respect to claims 1, 51 and 71, applicants argue, citing examiner's citation in the previous rejection of the claim, by saying that Palermo et al. does not explicitly disclose "adjusting electrical characteristics of the first circuit to increase a magnetic field generated by the transducer and adjusting electrical characteristics of the second circuit to increase a signal generated by the transducer."

**Response 1:** examiner agrees with applicant. Palermo et al. disclose, not only inductive coupling, but also the use of three transducers to be multiplexed and selected for transmission or reception (see page 5, lines 15-27). But, do not explicitly disclose adjusting electrical characteristics of the first circuit to increase a magnetic field generated by the transducer and adjusting electrical characteristics of the second circuit to increase a signal generated by the transducer." As discussed in the body of the rejection of claim 1 above, this was the reason to add the second reference issued to Kommrusch.

**Argument II:** again with regard to claim 1, applicant further argues by saying "the Kommrusch tuning circuit is thus adaptable for use in various systems using various antenna types and impedances. This is fundamentally different from applicants' invention as recited in claim 1, which includes coupling a transducer to two circuits,

where one circuit increases the magnetic field on transmission and the other circuit increases the signal generated by the transducer on reception. Kommrusch neither discloses the tuning network uses different values for transmission or reception nor different characteristics are user for generating or receiving signals.

**Response II:** examiner respectfully disagrees with the argument for the following reasons. First, there is no mention of the use of different values for the circuits recited in claim 1. Second, there is no mention of coupling a transducer to two circuits, which implies the connection as being simultaneous. Rather, what is recited is "coupling a transducer to a selected first or second circuit for either transmitting or receiving." As can be seen in this recitation, only one circuit can be connected to the transducer at any given time, but not two circuits at same time as implied. This point is underscored by the word 'or'. Third, regarding the issue of increasing the magnetic field on transmission and the increasing the signal generated by the transducer on reception, Palermo et al. discloses that "circuitry may be used to select the transducer or transducers having the strongest signal for transmission and reception to reduce the total power consumption of the devices." (see page 5, lines 18-20). So, the remaining issue in this argument is "adjusting circuit characteristic", which is taught by Kommrusch, as discussed in the rejection of the claims, particularly claim 1, above. Kommrusch, teaches that antenna coupling circuit can include a plurality of inductance sections (inductance bank) and plurality of capacitors (capacitor bank) selectively connected into the circuit by switches wherein at least one bank, with the values of the elements in the banks being related in a binary manner (see col. 1, line 36-col. 2, line 31, particularly, col. 1, lines 44-65).

Hence, the issue of adjusting circuit characteristics is satisfied with the teaching of Kommrusch.

**Argument III:** still, regarding claim 1, applicants argue by saying “although Kommrusch coupling circuit may be used for transmission or reception, Kommrusch neither discloses the tuning network uses different values for transmission or reception nor discloses that different circuit characteristics are used for generating or receiving signals.

**Response III:** examiner respectfully disagrees with the argument. Kommrusch teaches about the use of at least one bank of inductance and one capacitor bank, with values of elements (see col. 1, lines 44-65). Examiner considers these values of elements as being different and used for both transmission and reception. One of ordinary skill in the art realizes that elements in a bank of inductors and/or capacitors can not have same value. So, contrary to applicants’ argument, Kommrusch teaches about circuit characteristics with different values.

**Argument IV:** with regard to claim 11, applicants argue by saying that claim 11 should be allowable over Palmero et al. in view of Kommrusch for reasons stated/argued regarding claim 1.

**Response IV:** examiner contends that claim 11 is not allowable over Palmero et al. in view of Kommrusch for reasons/responses provided regarding claim 1, since the features of claims 1 and 11 are similar except the switching feature in claim 11, but, which is also provided in both of the references.

**Argument V:** with regard to claim 36, applicants argue by saying that claim 36 should be allowable over Palmero et al. in view of Kommrusch for reasons stated/argued regarding claim 1.

**Response V:** examiner contends that claim 36 is not allowable over Palmero et al. in view of Kommrusch for reasons/responses provided regarding claim 1, since the features of claims 1 and 36 are similar. The reduction (adjustment) of the overall impedance is given by Kommrusch, while the switching feature can be found in both of the references.

### ***Allowable Subject Matter***

Claims 21, 25, 40-42, 45, 59-61, 68 and 81 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Meless N Zewdu whose telephone number is (703) 306-5418. The examiner can normally be reached on 8:30 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on (703) 308-5318. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

Meless Zewdu

M. Z.

Examiner



WILLIAM TROST  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600

06 December 2004.